

Rocky Mountain National Park Initiative Air Quality Control Commission Update February 21, 2013



Agenda

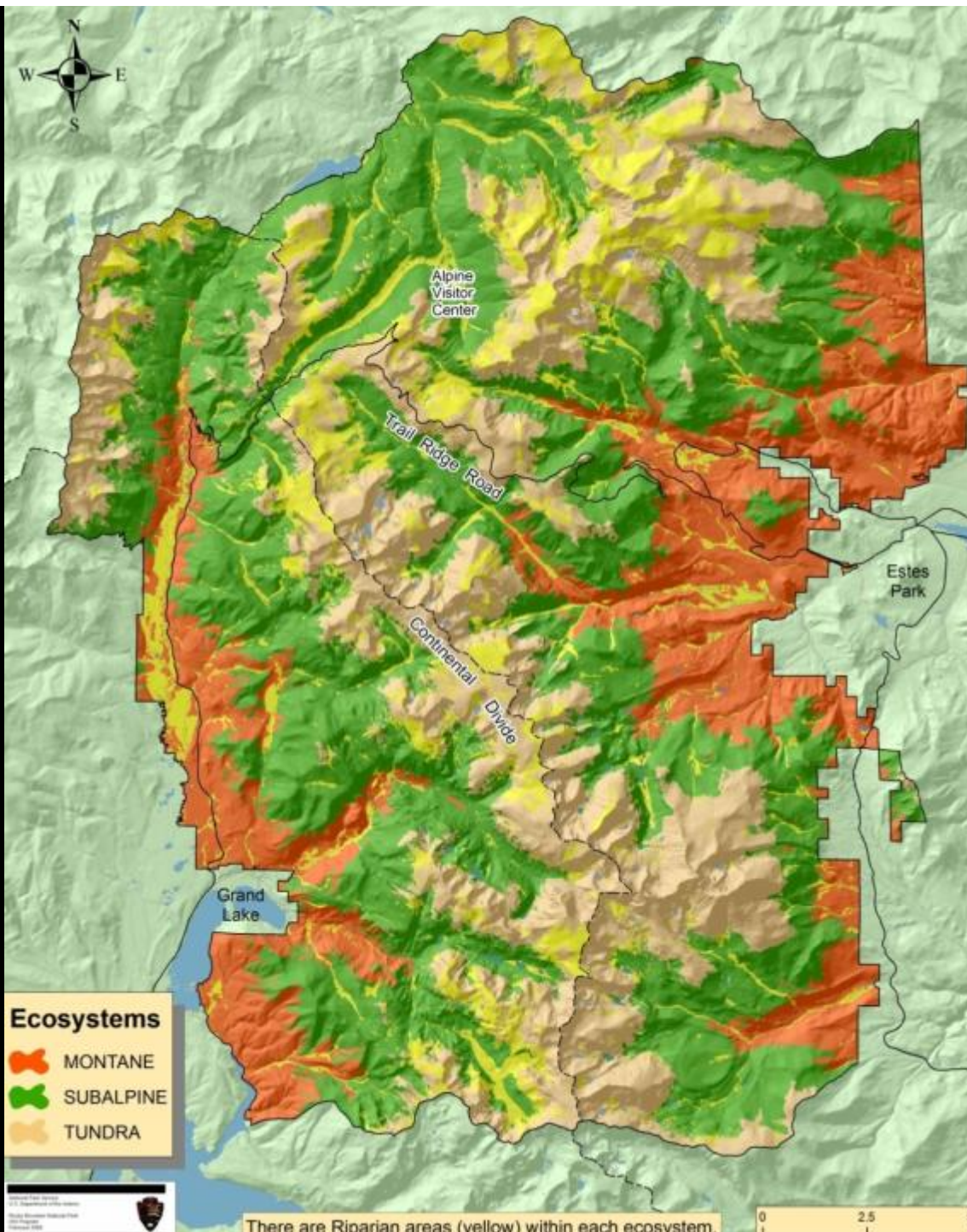


- Scientific Justification
- Resource Management Goal
- Nitrogen Deposition Reduction Plan & Contingency Plan
- Monitoring & Trends
- NOx and Ammonia Updates
- Lessons Learned
- Approach for achieving 2012 milestone

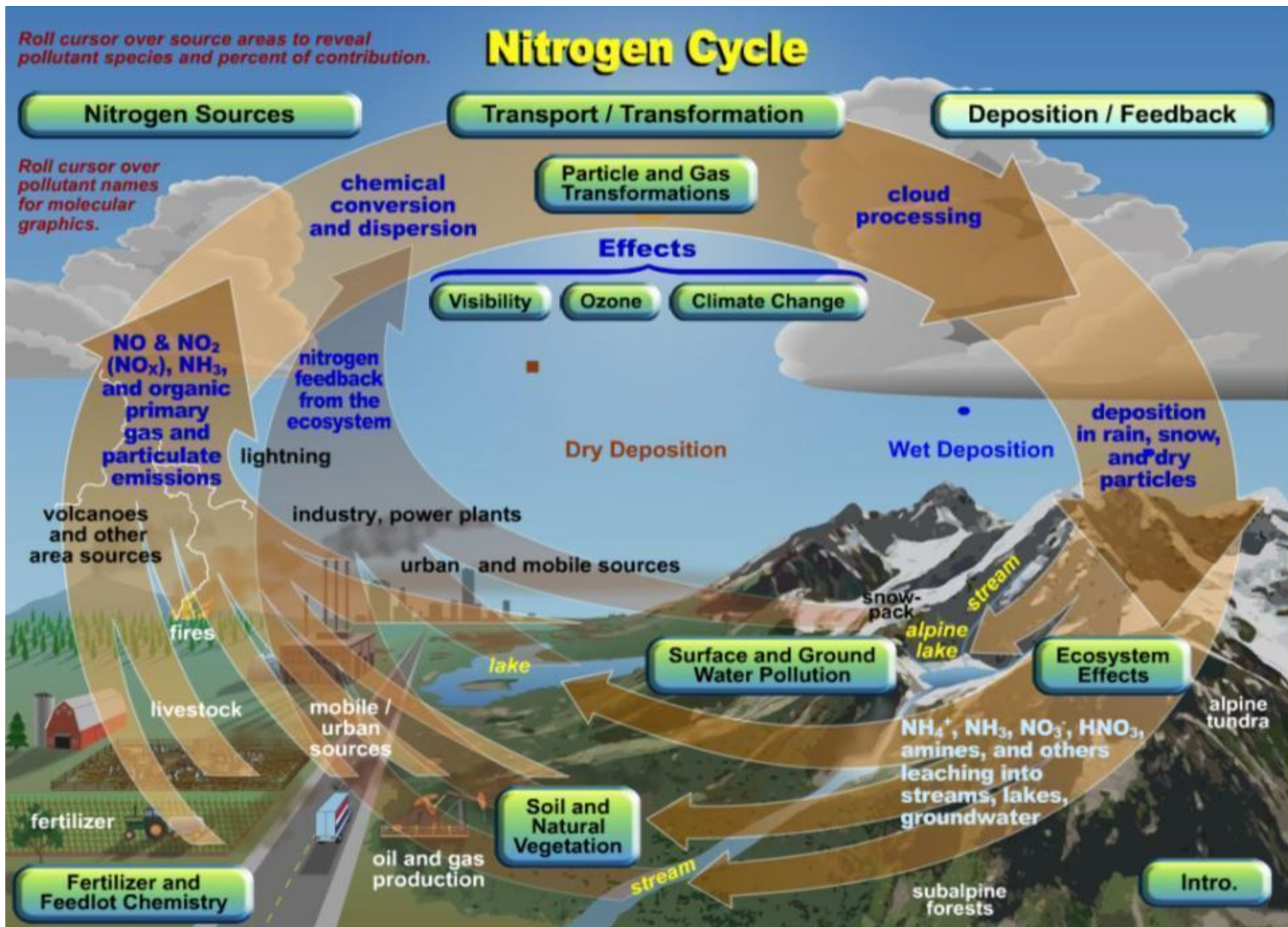


Rocky Mountain National Park

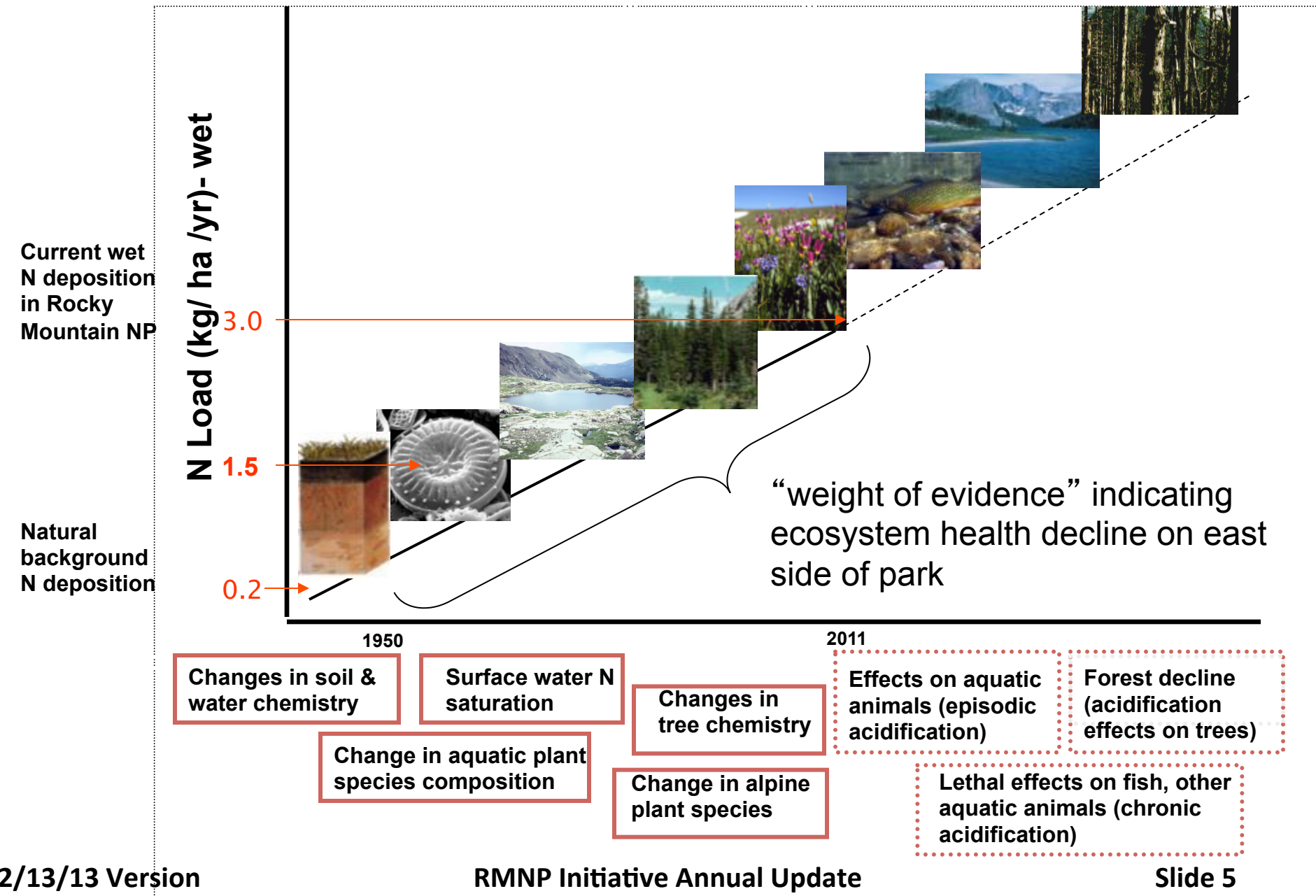
2/13/13 Version



Slide 3

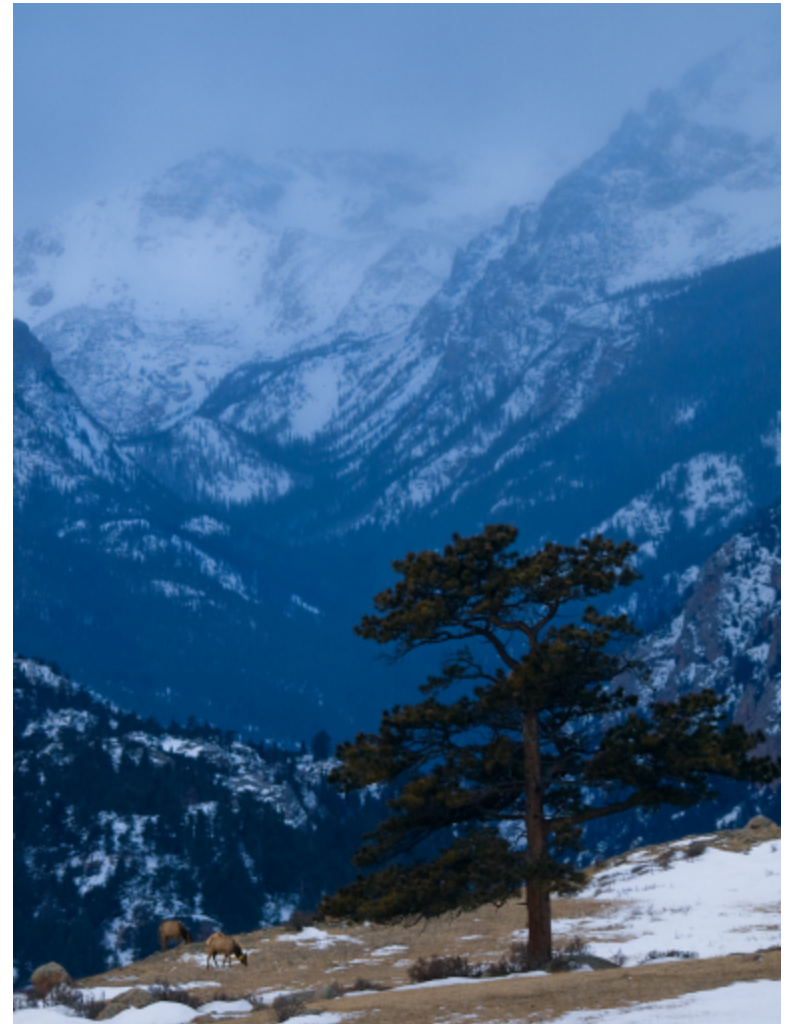


Rocky Mountain NP: Continuum of Impacts to Ecological Health— As N deposition rates increase, more resource types are impacted



NDRP Resource Management Goal

- **Current 5-year average wet deposition is ~ 3.0 kg N/ha/yr (equivalent to 2.7 lbs N/acre/yr)**
- **Natural background estimated at 0.2 kg N/ha/yr**
 - **Current deposition about 15.5 times higher than pre-industrial levels**
- **Peer-reviewed research shows significant harmful effects to ecosystems occur at wet deposition levels above 1.5 kg N/ha/yr.**



Nitrogen Deposition Reduction Plan

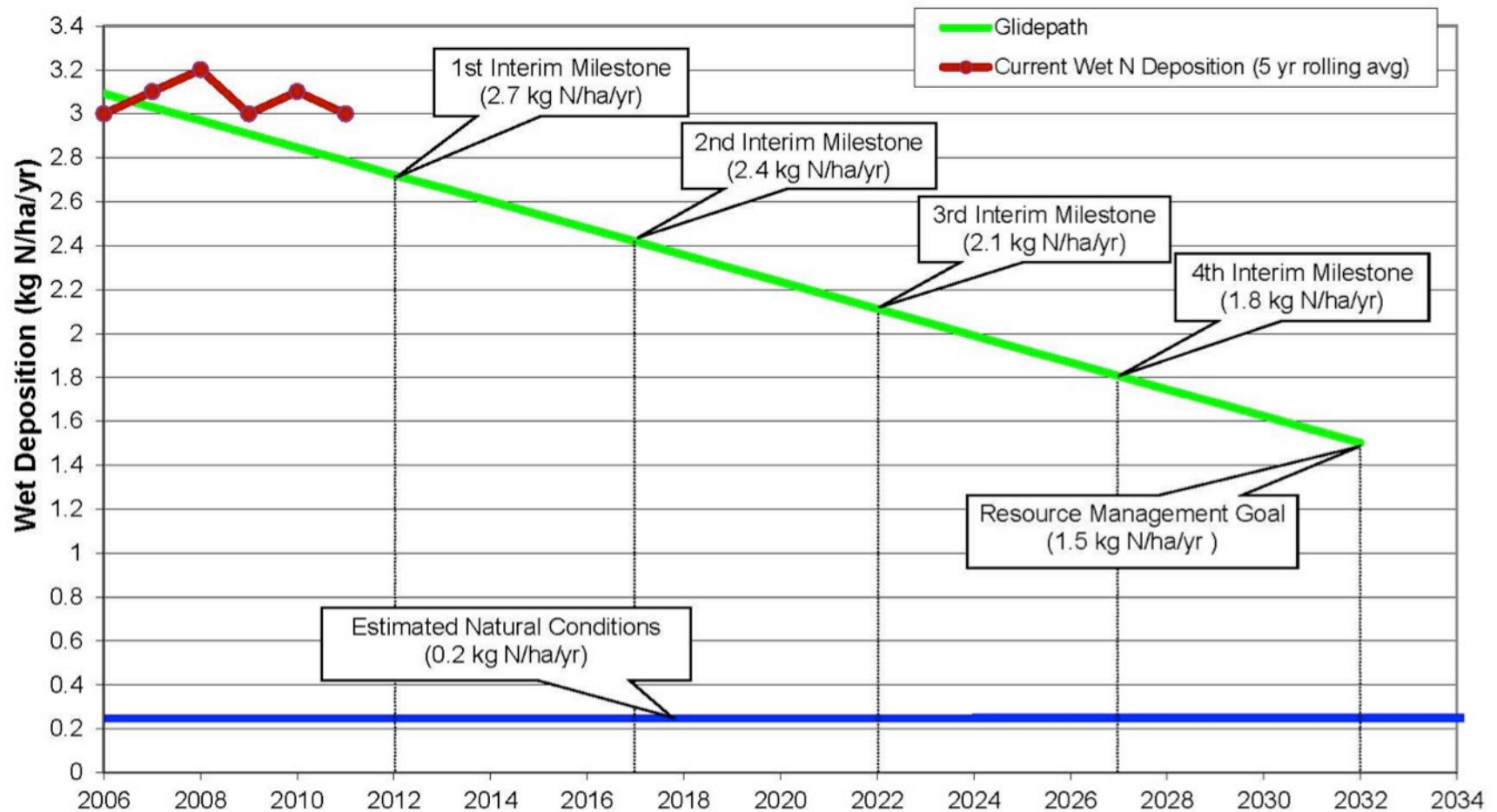
- Plan endorsed by NPS, EPA and CDPHE and the Colorado Air Quality Control Commission on August 16, 2007

❖ Significant Aspects of the Plan

- 1) Management approach based on collaborative process
- 2) Voluntary approach, no mandatory requirements or standards
- 3) Sets long-term (25 year) resource management goal
- 4) Sets timeline and interim (5-year) milestone goals intervals to achieve nitrogen reduction goal by 2032
- 5) Strategies to achieve goal
- 6) Identifies options that can be implemented on a voluntary basis

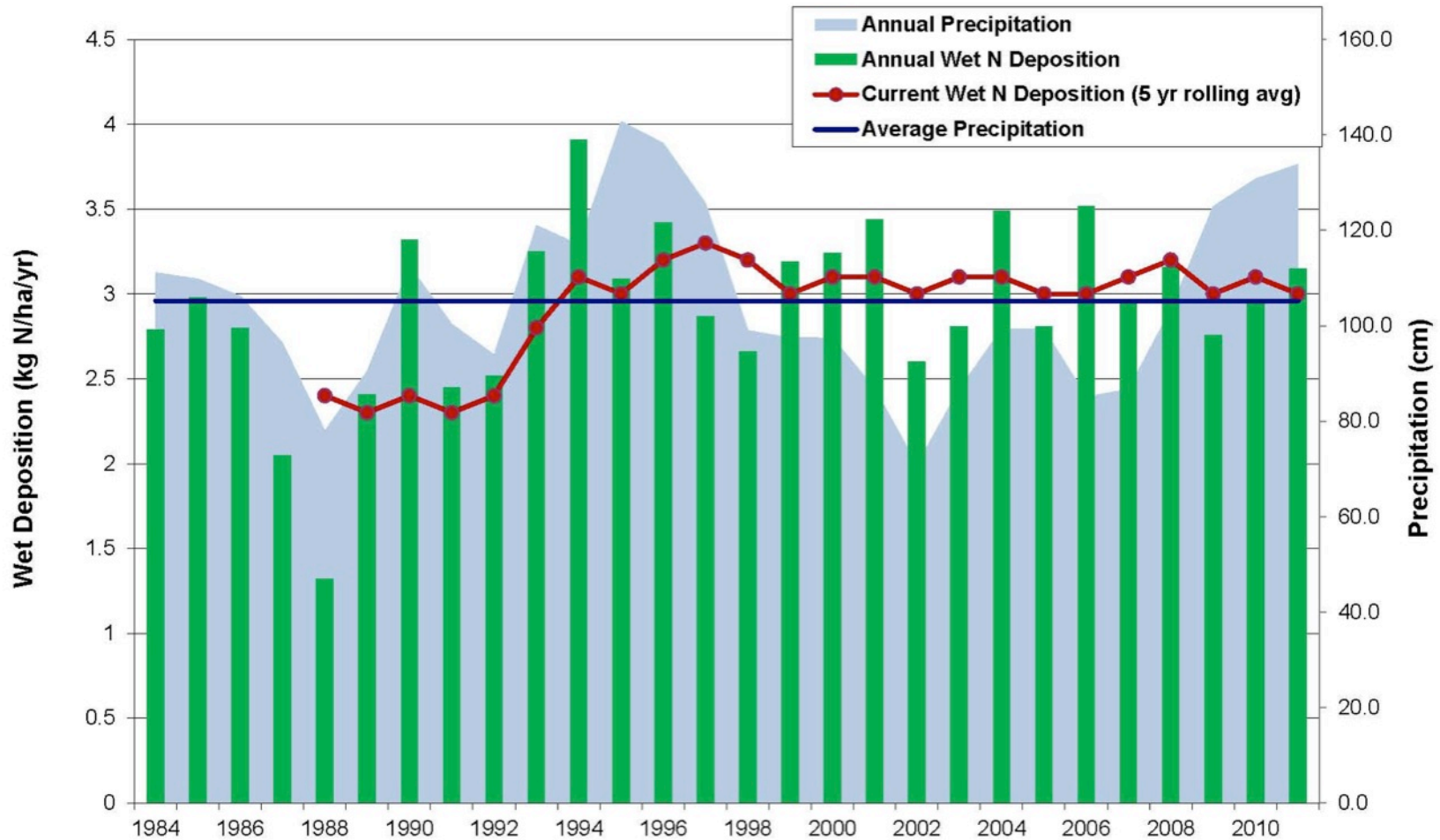


Loch Vale Nitrogen Deposition Reduction Plan Glidepath



Rocky Mountain National Park

Wet Nitrogen Deposition at Loch Vale Monitor



Nitrogen Deposition Reduction Contingency Plan

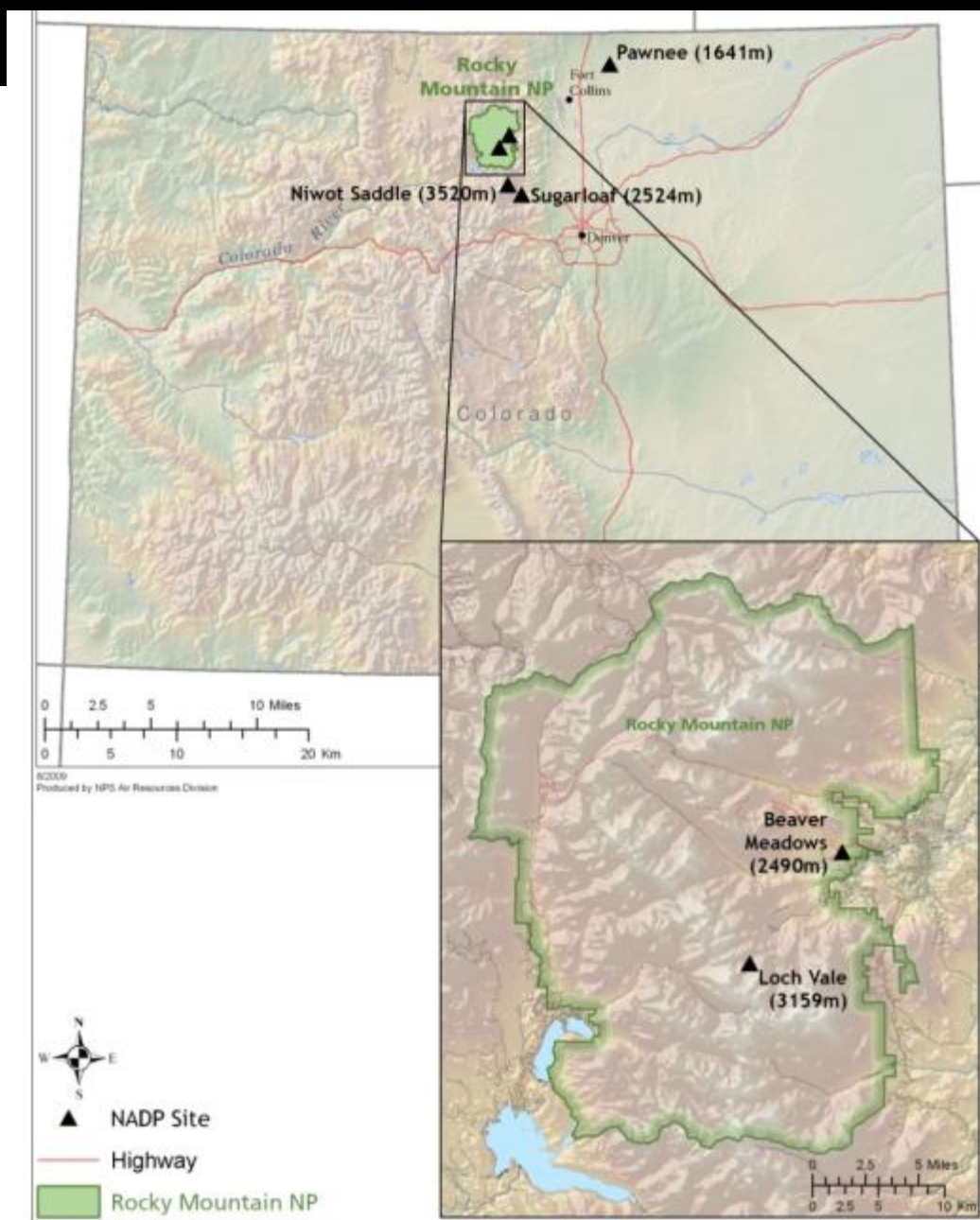
- Plan endorsed by NPS, EPA and CDPHE and the Colorado Air Quality Control Commission on June 22, 2010

❖ Adaptive management approach consisting of 5 elements:

1. Data Tracking Plan
2. Triggering Mechanism
3. Recommending & Implementing Contingency Measures
4. List of Potential Contingency Measures
5. Public Outreach & Participation



Monitoring Regional Nitrogen Deposition Trends To Determine Effectiveness



Monitoring & Tracking Report Update (2011)

» Has nitrogen deposition decreased at RMNP or other sites in the region?

- Long-Term Statistical Trend (1984-2011):

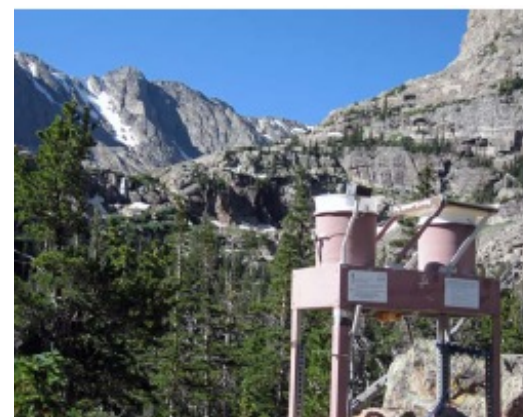
- No trend in wet nitrogen deposition (went from increasing to flat!)
- Ammonium is increasing at 3 out of 5 sites
- No trend in nitrate

- Short-Term 5 or 7 year Statistical Trends (2007-2011 or 2005-2011):

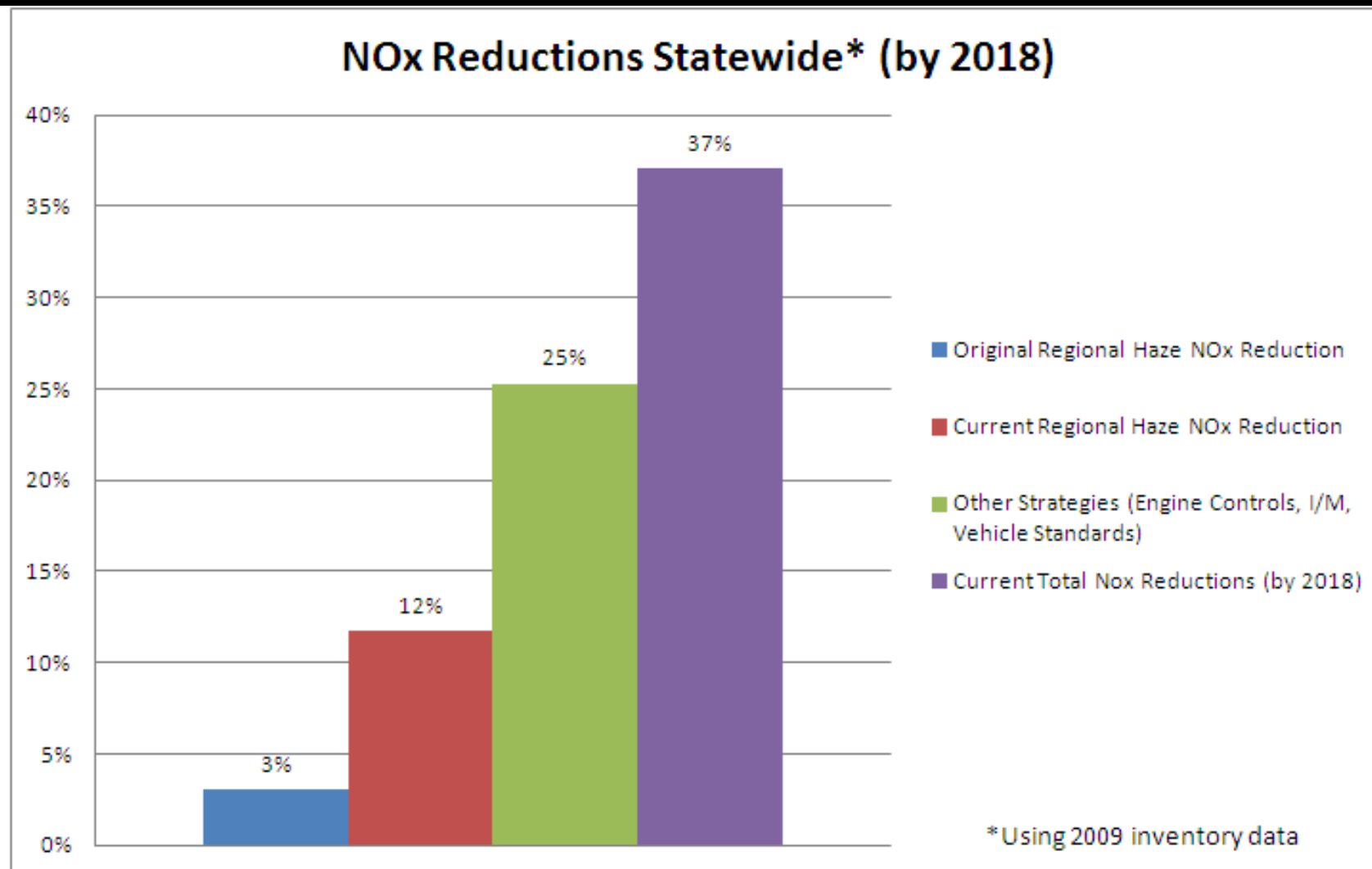
- No trend in wet nitrogen deposition
- Ammonium is decreasing at 1 out of 5 sites
- Nitrate is decreasing at 2 out of 5 sites

- Co-located site

- Passive ammonia samplers



Nitrogen Reductions (on-the-way)



National Air Emissions Monitoring Study (NAEMS)

- Study result of 2005 voluntary agreement between EPA and Animal Feeding Operation (AFO) Industry
- Participants: broiler, swine, egg-layer and dairy industries
- 25 study sites in 10 states monitored from 2007 – 2010
- March 13, 2012 FR Notice for public comment on documents
- Formation of “Animal Feeding Operations Emission Review Panel”
 - Public meetings held in March, August, October 2012
- Draft report submitted to Science Advisory Board and Public on December 3, 2012



RMNP Agriculture Subcommittee - Research Progress

Lessons Learned

- Ammonia emissions from agricultural areas are seasonal.
 - Identifies the need for seasonal management practices.
 - Early Warning System, especially during spring and fall.
- Nutritional Trials
 - Managing crude protein and phase feeding can reduce the amount of ammonia emitted from the animal.
 - Impact on animal performance/muscle still unknown
- Growth Hormones/Implants
 - High cost and societal concerns
- Large scale nitrogen balance studies needed to quantify how much ammonia is lost during specific manure handling practices such as breaking manure mounds, turning compost, land application, pumping lagoon effluent to a center pivot, etc.

RMNP Agriculture Subcommittee

Recent Developments



- USDA, NRCS Ammonia Air Quality Initiative
 - Targeted cost-share BMP program
- “Early Warning System” would advise agriculture producers to avoid high nitrogen-emitting activities (e.g. manure handling) during specific periods of time when weather conditions could readily transport nitrogen into the park (CSU)
- 2 year Early Warning System Development Pilot
- Approx. \$189K committed
 - \$44k+ Colorado Agriculture Industry
 - \$10k Rocky Mountain National Park
 - \$40k NPS Air Resource Division
 - \$20k CDPHE APCD
 - \$30k potential from CDPHE DEHS
 - Texas A&M(\$20k), CSU(\$25k) in-kind support
 - EPA is looking for additional research funds to support system development

RMNP Agriculture Subcommittee Reflections

- ❖ Air quality issues at RMNP are a long-term problem.
- ❖ Actions being taken today are shaping the dialogue, course and process.
- ❖ More research is needed to develop effective and cost-effective practices.
- ❖ There are a lot of pressures on agriculture. The voluntary approach is vital to researchers and producers.
- ❖ Need to think holistically about all environmental issues facing agriculture.
- ❖ Ag industry needs certainty built into voluntary efforts.



Initiative - Lessons since 2005



- Working on ability to communicate effectively and consistently
- Recognizing that collaboration is a journey
- Nitrogen deposition is a complex issue with many moving parts
- Different agency objectives
- Participation shifts (agency roles)



Colorado Department
of Public Health
and Environment



2013 Interim Goal Achievement



Weight of Evidence Approach



- **Multiple determinants for milestone achievement**
- **Factors for consideration (under review by MOU agencies):**
 - **Regional site short- and long-term trends**
 - **Emission trends and scheduled reductions**
 - **Future ammonia-focused projects with potential for reductions**
 - **National and state-level understanding and collaboration of ammonia emissions**

Acknowledgements

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Questions?

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RMNP Website: www.colorado.gov/cdphe/RMNPinitiative